

VITA-350E

**GPS, GPRS, DI/O, RS232
Automatic Vehicle Location
Device**

User Manual

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<http://www.advantech.com/eplatform>

For technical support and service, please visit our support website at:

<http://www.advantech.com/support>

This manual is for the VITA-350E.

Packing List

Before you begin installing your device, please make sure that the following materials have been shipped:

- VITA-350E device
- 1 CD-ROM with User Manual, Advantech Utility
- 1 User Manual
- 1 GPS antenna
- 1 GPRS antenna
- 1 power cable
- 4 mounting screws



If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Model No. List	Description
VITA-350E	GPS, GPRS, DI/O and RS232

FCC

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference, and*
- 2. This device must accept any interference received, including interference that may cause undesired operation*

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution!



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

根據交通部低功率管理辦法規定：

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Additional Information and Assistance

1. Visit the Advantech web site at **www.advantech.com** where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error message

Contents

Chapter	1	Introduction	2
	1.1	Introduction	2
	1.2	Features	2
	1.3	Quick Installation Guide	2
	1.4	GPS Antenna Installation	3
	1.5	GPRS Antenna Installation	5
	1.6	Specifications	6
	1.6.1	GPRS Module Siemens Power Modes	6
	1.6.2	GPS Specifications	6
	1.6.3	GSM/GPRS Specifications of Siemens MC55 module	7
	1.6.4	Programmable Digital I/O	7
	1.6.5	Environmental Specifications	7
	1.6.6	Serial Connectivity	8
	1.6.7	LED Definition	8
	1.7	System Dimensions	9
		Figure 1.1: System Dimensions	9
Chapter	2	Connector Table	12
	2.1	Connector Table	12
	2.1.1	COM port connector (CN2)	12
	2.1.2	GPS antenna connector (CN3)	13
	2.1.3	SIM Holder (Subscriber Identification Module) (CN5)	14
	2.1.4	GPRS antenna connector (CN6)	15
	2.1.5	Battery Connector (CN9)	16
	2.1.6	GPIO (General Purpose Input Output) (CN11)	17
	2.1.7	Power Connectors (CN14)	18
	2.1.8	Power Reset button (SW1)	19
	2.2	LED Definition	20
Chapter	3	Advantech M2M Utility	22
	3.1	Overview	22
	3.1.1	Installation	22
	3.1.2	PC System Requirements	22
	3.1.3	Installing M2M Utility	23
	3.1.4	How Does VITA-350E Work?	23
	3.2	Getting Started	24
	3.2.1	Command Page Tab	27
	3.2.2	Screen Emulator Tab	28
	3.2.3	Configuration Tab	29
	3.2.4	GPIO Setting Tab	33
	3.2.5	Query GPS Tab	34
	3.2.6	Upgrade Firmware Tab	35

3.2.7	Test Mode Tab	41
3.2.8	Data Format Tab	42
3.2.9	About Tab	43
3.3	Format for Sending Packets	43
Appendix A	GPIO Definition	50
A.1	GPIO Definition	50
A.2	GPIO DC Spec.	51
Appendix B	Accessories	54
B.1	Power Cable	54
Appendix C	Mechanical Drawing	58
	Figure C.1:VITA-350E Mechanical Drawinnng	59

General Information

This chapter gives background information on the VITA-350E.

Sections include:

- Introduction
- Features
- Quick Installation Guide
- RF Antenna Installation
- Specifications
- System Dimensions

Chapter 1 Introduction

1.1 Introduction

Advantech's first M2M product - VITA-350E provides in-vehicle data solutions while operating over GSM/GPRS networks for Fleet Management. A 16-channel GPS module, 1 x RS232 and 10 x digital I/O ports allow for advanced tracking and alarms.

1.2 Features

- Turnkey Solution

Compact Industrial hardware design with intelligent software capabilities, making it a reliable Fleet Management solution.

- Versatile I/O Interfaces

10 GPIO, 1 x RS-232 serial port allows you to monitor and connect to external devices.

- Embedded SDK for easy configuration

Equipped with Advantech's easy-to-use M2M Utility, VITA-350E offers easy management and integration for all devices.

- Wireless firmware updates

VITA-350E provides remote wireless upgrades over the air (OTA). No need to re-set parameters on the local site, saving time and cost for field maintenance.

1.3 Quick Installation Guide

Before you install, please check the below items:

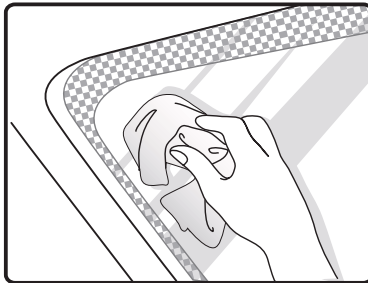
1. Check if all the parts are included within the package.
2. Prepare a SIM card for GSM/GPRS communication (make sure the GPRS function has been enabled). Use a mobile phone to confirm that the PIN code has not been set and make sure the SIM card is working properly.
3. Find a suitable place inside the vehicle for installation.
4. Find a suitable place to install VITA-350E and point the external GPS antenna toward the sky - not covered or shielded by any other-object containing metallic material.

5. Check if all the wiring has been connected correctly; connect the AVL unit to the power source (12 or 24 VDC).
6. Check all LED indicators initially blink regularly to confirm VITA-350E's working status.
7. Attach VITA-350E with a wall mount kit or strong adhesive double-sided tape and make sure VITA-350E will sustain vibration or shock conditions.

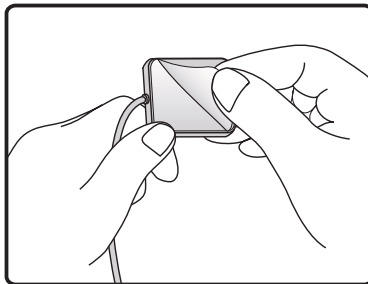
1.4 GPS Antenna Installation

The antenna must be mounted so it is visible to the sky. The windshield must be cleaned before the antenna is mounted. Ensure that tinted or any metallic objects do not obscure the line of sight.

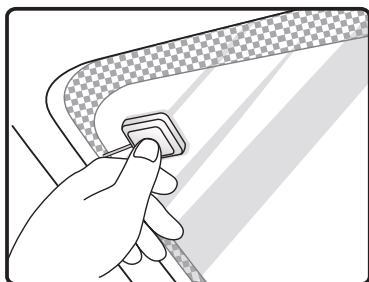
Step 1: Clean the inside of the windshield.



Step 2: Peel off the adhesive tape cover.

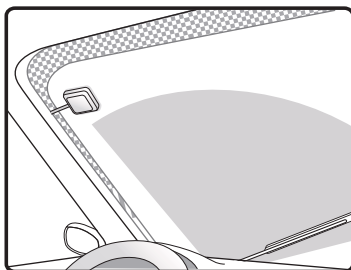


Step 3: Push the antenna firmly into position.

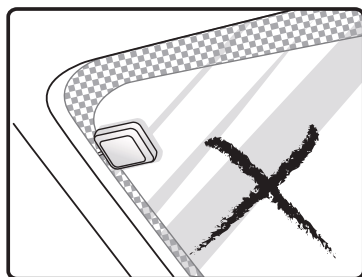


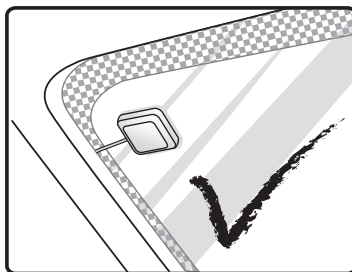
Note:

1. Do not mount within the wiper movement arc area.



2. Do not mount on the tinted area as displayed below.





3. The adhesive tape side is the active side and must face the sky.
4. Do not mount on the tinted area at the top of some widescreens as these can contain metal content and may degrade the antenna sensitivity.
5. Avoid running the antenna cable next to antenna cables from two way radios, cell phones etc.
6. Do not lengthen/shorten the shielded antenna cable.
7. Route the shielded antenna cable through the ferrite core in order to minimise radio frequency interference.
8. Take special care when plugging and unplugging the antenna connector.
9. Take care not to place the antenna under a structure such as a metal roof rack.

1.5 GPRS Antenna Installation

The windshield must be cleaned before the antenna is mounted and it must be mounted vertically - not horizontally!

Note: Any 3rd party transmitting/receiving device can affect the sensitivity and range of the RF.

1. Avoid running the antenna cable next to antenna cables from two way radios, cell phones etc.
2. Do not strengthen/shorten the shielded antenna cable.
3. Take special care when plugging and unplugging the antenna connector into the male/female connector.

1.6 Specifications

1.6.1 GPRS Module Siemens Power Modes

Parameter	Description	Condition	Min	Type	Max	Unit
I _{BATT+}	Average supply current ₍₃₎	Power Down Mode		50	100	μA
		Sleep mode at DRX=2		4.3		
		@DRX=5		3.0		mA
		@DRX=9		2.5		
		IDLE mode at DRX=2				
		EGSM 900 ₍₁₎₄₎		15		
		GSM 1800/1900 ₍₂₎₄₎		15		mA
				15		
		DATA mode GPRS,				
		(4 Rx, 1Tx) GSM 850 ₍₁₎₄₎		300		
		EGSM 900 ₍₁₎₄₎		300		mA
		GSM 1800/1900 ₍₂₎₄₎		230		

Notes:

- 1) Power Control Level PCL 5
- 2) Power Control Level PCL 0
- 3) All average supply current values at I_{VDD}=0mA
- 4) Test condition for the typical values: 50 Ω antenna

1.6.2 GPS Specifications

16 channel ANTARIS 4 positioning

Supports different serial protocols (NEMA, UBX, & RTCM)

Supports active antenna

Short antenna and open circuit

Power brown-out protection: No external reset hardware needed

Operating temperature range: -40 to 85°C

- Accuracy

Position 2.5m CEP₃ 5.0m SEP₄

Position DGPS/SBAS2 2.0m CEP 3.0m SEP

- Acquisition_{5_6}

GPS_Mode_(U BX-CFG_Msg)	Fast Acquisition Mode	Normal Mode	High Sensitivity Mode	Auto Mode
Cold Start	34s	36s	41s	34s
Warm Start	33s	N/A	N/A	N/A
Hot Start	<3.5s	N/A	N/A	N/A
Re-acquisition	<1s	N/A	N/A	N/A

- Sensitivity₇

Tracking -158 dBm

Acquisition & re-acquisition -148 dBm

Cold starts -142 dBm

1.6.3 GSM/GPRS Specifications of Siemens MC55 module

Tri-band MC55 EGSM900 /GSM1800/1900

GPRS multi-slot Class 10

GPRS mobile station Class B

Download: Max. 85.6 Kbps

Uplink: Max. 42.8 Kbps

Coding Scheme: CS1-4

Internet service: TCP, UDP, HTTP, FTP, SMTP, POP3

1.6.4 Programmable Digital I/O

Digit GPIO: 5 In / 5 Out

VIH: 2.64~3.3V (Input logic 1)

VIL: 0~0.66V (Input logic 0)

VOH: 3.2~3.3V (Output logic 1)

VOL: 0~0.4V (Output logic 0)

Maximum DC current: 5mA

1.6.5 Enviromental Specifications

Operating Temperature:

Storage Temperature:

Humidity: 5-85% RH

Vibration Test:

1.6.6 Serial Connectivity

1 RS-232 TX/RX up to 230Kbps

1.6.7 LED Definition

Green LED (Power Indicator)	
LED Mode	VITA-350E status
1 LED ON	+12/+24 V power ON
2 LED OFF	+12/+24 V power OFF
Red LED (GPS Indicator)	
LED Mode	VITA-350E status
1 LED 1s ON / 1s OFF	2D acquisition accomplishment
2 LED OFF	GPS signal searching
	GPS not working
	No GPS signal
Blue LED (GPRS Indicator)	
LED Mode	VITA-350E status
1 LED Permanently ON	GPRS power down
2 LED 600ms ON/ 600ms OFF	Limited Network Service: No SIM inserted. No PIN installed. Network search in progress. Ongoing user authentication. Network login in progress.
3 LED 75ms ON/ 75ms OFF/ 75ms ON/ 3s OFF	GPRS network activated
4 LED 0.5s ON/ OFF depending on transmission activity	GPRS data transfer in progress. LED goes ON within 1 sec after data packets were exchanged.
Orange LED (Error Indicator)	
LED Mode	VITA-350E status
1 LED ON	Error status
2 LED OFF	System OK

1.7 System Dimensions

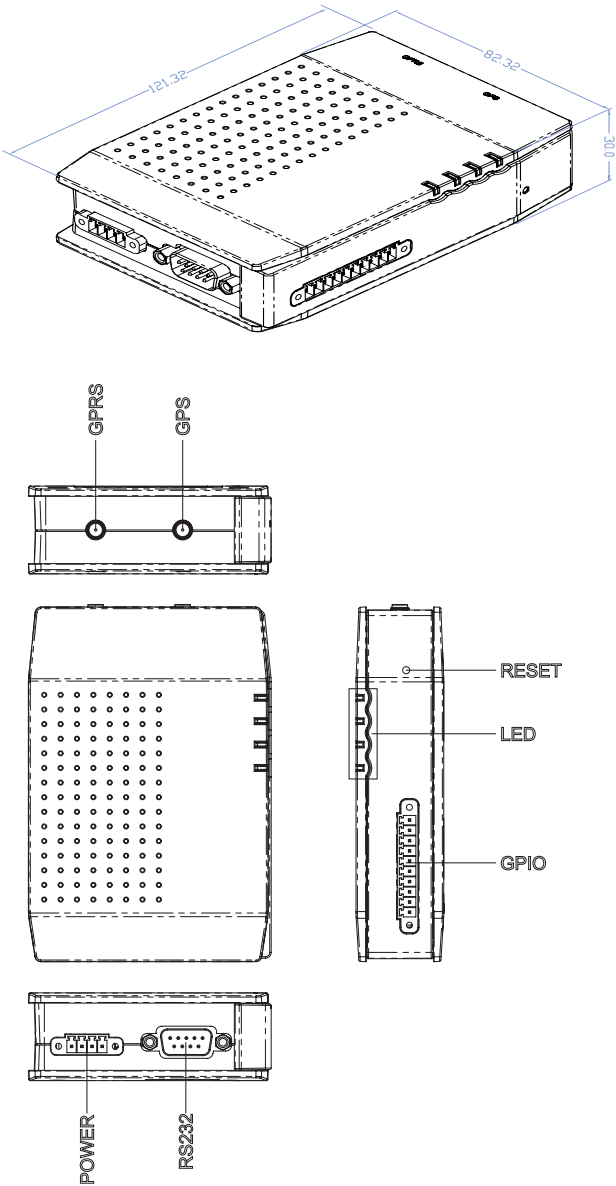


Figure 1.1: System Dimensions

Connector Table

This chapter explains the setup procedures of VITA-350E hardware, including instructions on connecting peripherals and indicators. Be sure to read all safety precautions before you begin the installation procedure.

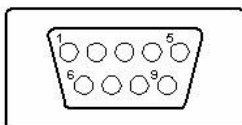
Chapter 2 Connector Table

2.1 Connector Table

2.1.1 COM port connector (CN2)

The VITA-350E provides one serial port (COM1: RS-232 TX/RX) via one DB-9 connector (COM1). The pin assignments for the COM port connector are in Appendix A.

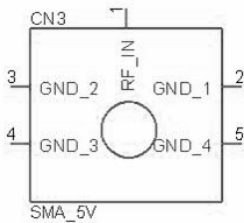
CN2	COM1		
Part Number	1654000056		
Footprint	DBCOM-VM5MS		
Description	D-SUB CON. 9P 90D(M) DIP 070241MR009S200ZU SUYIN		
Pin	Pin Name	Signal Type	Signal Level
1	NC		
2	RXD#	IN	+5V
3	TXD#	OUT	+5V
4	NC		
5	GND		
6	NC		
7	NC		
8	NC		
9	NC		



2.1.2 GPS antenna connector (CN3)

The GPS function needs the expander antenna, and the GPS connector is a standard female SMA connector.

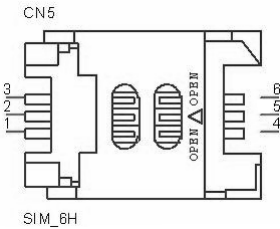
CN3	GPS Antenna Con.		
Part Number	1654001599		
Footprint	RF-SMAC037		
Description	RF Conn 5p 180D(F) DIP SMA-C037-G		
Pin	Pin Name	Signal Type	Signal Level
1	RF_IN		
2	GND		
3	GND		
4	GND		
5	GND		



**2.1.3 SIM Holder (Subscriber Identification Module)
(CN5)**

Supports +3V SIM card and SIM interface compatible with ISO 7816 IC card standard.

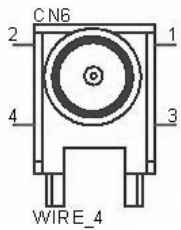
CN5	SIM Holder		
Part Number	1654000639		
Footprint	SIM-WL608C		
Description	SIM card conn 6p 90D(F)SMD WO/Pb WL608C3-M04-TR		
Pin	Pin Name	Signal Type	Signal Level
1	SIM_CCVCC	IN	+3V
2	SIM_CCRST		
3	SIM_CCCLK		
4	GND		
5	NC		
6	SIM_CCIO		



2.1.4 GPRS antenna connector (CN6)

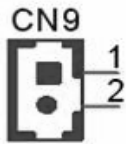
The GPRS function needs the expander antenna, and the GPRS connector is a standard female reverse SMA connector.

CN6	GPRS Antenna Con.		
Part Number	1700004811		
Footprint	CABLE-SMAFN9		
Description	Coaxial cable 10cm SMT SMA(F) to I-PEX		
Pin	Pin Name	Signal Type	Signal Level
1	GND		
2	GND		
3	GND		
4	GND		



2.1.5 Battery Connector (CN9)

CN9	Battery Con.		
Part Number	1655902032		
Footprint	WHL2V-125		
Description	WAFER 2P 180D(M) 1.25 mm 53047-0210		
Pin	Pin Name	Signal Type	Signal Level
1	BAT_VCC	PWR	+3.3V
2	GND		

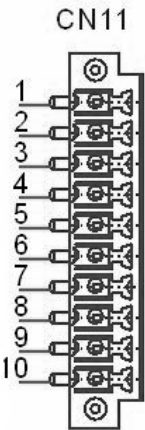


WB_2V_1.25mm

2.1.6 GPIO (General Purpose Input Output) (CN11)

The board supports 10-bit GPIO through GPIO connector. The 10 digital in/out-puts can be programmed to read or control devices. The default setting is 5 bits input and 5 bits output.

CN11	GPIO		
Part Number	1652000746		
Footprint	ME050-35010		
Description	PLUG-IN BLOCK 10P 90D DIP ME050-35010 WO/PB		
Pin	Pin Name	Signal Type	Signal Level
1	GPIO1	I/O	+3.3V
2	GPIO2	I/O	+3.3V
3	GPIO3	I/O	+3.3V
4	GPIO4	I/O	+3.3V
5	GPIO5	I/O	+3.3V
6	GPIO6	I/O	+3.3V
7	GPIO7	I/O	+3.3V
8	GPIO8	I/O	+3.3V
9	GPIO9	I/O	+3.3V
10	GPIO10	I/O	+3.3V



PLUG_10_3.50mm

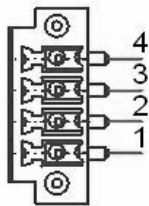
2.1.7 Power Connectors (CN14)

Main power connector, +12 V / +24 V (CN14)

Supplies main power to the VITA-350E.

CN14	Power Con.		
Part Number	1652000744		
Footprint	ME050-35004		
Description	PLUG-IN BLOCK 4P 90D DIP ME050-35004 WO/P		
Pin	Pin Name	Signal Type	Signal Level
1	B+	PWR	+12V / +24V
2	ACC	IN	
3	GND		
4	GND		

CN14

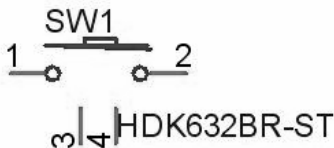


PLUG_4_3.50mm

2.1.8 Power Reset button (SW1)

Momentarily pressing the **Reset** button will activate a reset.

SW1	Power Reset Button		
Part Number	1601063200		
Footprint	SW-HDK632BR-ST		
Description	PUSH SW L=5.85mm reset button HDK632BR		
Pin	Pin Name	Signal Type	Signal Level
1	GND		
2	uP_RESET#		
3	GND		
4	GND		



2.2 LED Definition

Red LED (Power Indicator)

LED Mode	VITA-350E status
1 LED ON	+12/+24V power ON
2 LED OFF	+12/+24V power OFF

Yellow LED (GPS Indicator)

LED Mode	VITA-350E status
1 LED 1s ON / 1s OFF	2D acquisition accomplishment
2 LED OFF	GPS signal searching
	GPS not working
	No GPS signal

Green LED (GPRS Indicator)

LED Mode	VITA-350E status
1 LED permanently ON	GPRS power down
2 LED 600ms ON/ 600ms OFF	Limited Network Service: No SIM inserted. No PIN entered. Network search in progress. Ongoing user authentication. Network login in progress.
3 LED 75ms ON/ 75ms OFF/ 75ms ON/ 3s OFF	GPRS network activated
4 LED 0.5s ON/ OFF depending on transmission activity	GPRS data transfer in progress. LED goes ON within 1 sec after data packets were exchanged.

Orange LED (Error Indicator)

LED Mode	VITA-350E status
1 LED ON	Error status
2 LED OFF	System OK

Advantech M2M Utility

Advantech M2M Utility software is a comprehensive, flexible human machine interface application environment.

Sections include:

- Introduction
- Getting Started
- Format of Sending Packets

Chapter 3 Advantech M2M Utility

3.1 Overview

Advantech M2M Utility software is a flexible human machine interface application, which provides functions to customize M2M applications in Windows XP and Windows CE environments. M2M Utility software provides a simple GUI to set M2M data, GPS Tracking System and automation parameters.

VITA-350E is flexible and easy to use. Customers can use the M2M Utility software to setup information and parameters for add-on devices, which will automatically be detected and shown on the utility screen. After setting the server IP address, port and data formats, VITA-350E will automatically connect to the server and send GPS or I/O data to the server.

The VITA-350E RISC-based platform is a multi-threaded engine for optimal performance. It provides GPS/GPRS connectivity with other mobile and automation devices in cars, truck fleets and other transports. The VITA-350E platform ensures that you can integrate your process data into existing M2M information systems, or your own proprietary Geographical Information system data formats.

In addition, VITA-350E M2M Utility software utility leverages 32-bit Windows' preemptive multi-tasking capability to support Windows CE environments.

3.1.1 Installation

VITA-350E platform has all the necessary software built-in, you don't need to install anything on the VITA-350E product itself.

The M2M Utility for Windows XP is the client for configuring external devices and controlling VITA-350E remotely, you must copy and execute it on a PC system.

3.1.2 PC System Requirements

- OS : Microsoft Windows XP
- RAM : at least 128 MB memory
- Disk space: at least 4 MB space
- CPU: Intel Pentium II processor 400 MHz or higher
- Display: VGA resolution or higher
- Microsoft-compatible mouse

- Ethernet port

3.1.3 Installing M2M Utility

Advantech M2M Utility ships with an executable .exe program you just copy to your computer, run and follow the setup procedures.

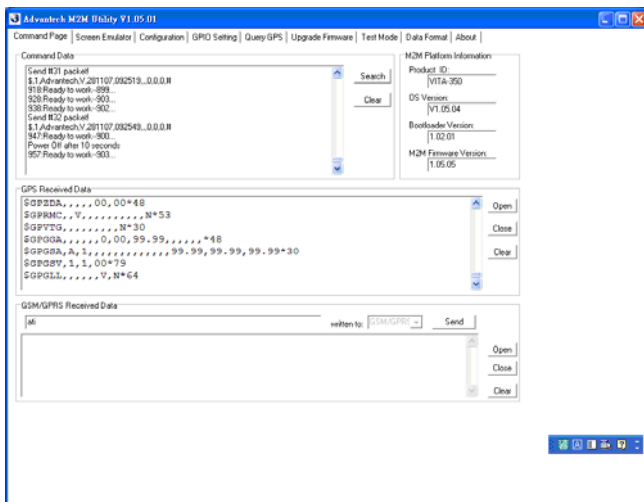
3.1.4 How Does VITA-350E Work?

VITA-350E platform includes two parts: Hardware platform + firmware and M2M Utility client software. VITA-350E device has one RS232 port that can be connected to your PC-based system.

VITA-350E platform is designed for the following applications:

- GPS/GPRS AVL/LBS applications.
- Data acquisition and transmission through GPRS
- Wireless connectivity
- Remote access control
- Easy device configuration

The M2M Utility is the client to configure and control the VITA-350E platform. The M2M Utility GUI is the following:

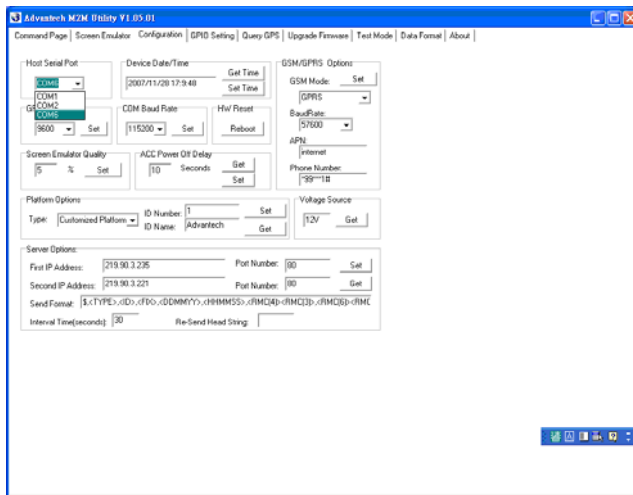


3.2 Getting Started

Getting Started explains how to use the VITA-350E M2M platform and complete some of the most common tasks within the M2M Utility software package.

As a quick introduction to using the VITA-350E platform, complete the following procedures to run the M2M Utility.

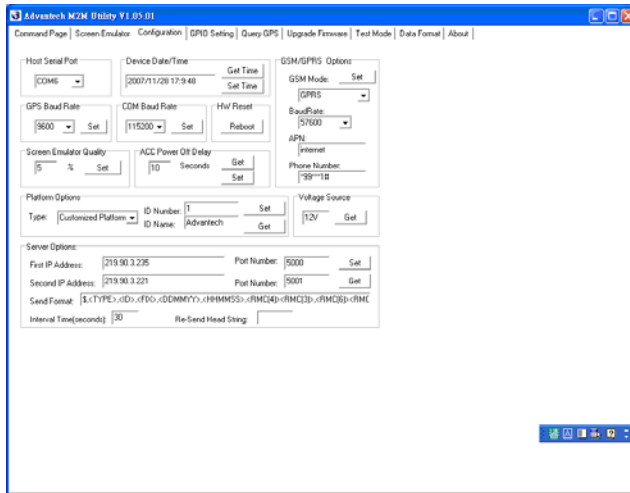
1. Power on the VITA-350E, plug-in a COM port modem cable connector to it and be sure that VITA-350E is connected to your PC.
2. Launch the *Advantech M2M Utility*.
3. Select your PC connected COM port on the *Configuration* page.



-
- Advantech M2M Utility V1.05.01
- Command Page | Screen Emulator | Configuration | GPIO Setting | Query GPS | Upgrade Firmware | Test Mode | Data Format | About
- Command Data
- Send RST packet
 I1 Advantech-V201107.002519..0.0.0
 918 Ready to work-009
 930 Ready to work-903
 930 Ready to work-902
 Send RST packet
 I1 Advantech-V201107.002549..0.0.0
 347 Ready to work-903
 Power Off after 10 seconds
 957 Ready to work-903
- M2M Platform Information
- Product ID: MTA360
 OS Version: V1.05.04
 Bootloader Version: 1.02.01
 M2M Firmware Version: 1.05.05
- GPS Received Data
- GPGPDA,,00,00+48
 GPGPBC,,V,,,,,,N+53
 GPGPTO,,,,,N+30
 GPGPDA,,,,,0,99,99,99+48
 GPGPDA,A,1,,,,,99,99,99,99,99,99+30
 GPGPST,1,1,00+79
 GPGPGL,,,,,V,N+64
- GSM/GPRS Received Data
- Written to: COM4 (GPRS) Send

- Chapter 3 Advantech M2M Utility

6. Define your server IP, port and data send format. Then press the **Set** button on the *Server Option Group*.

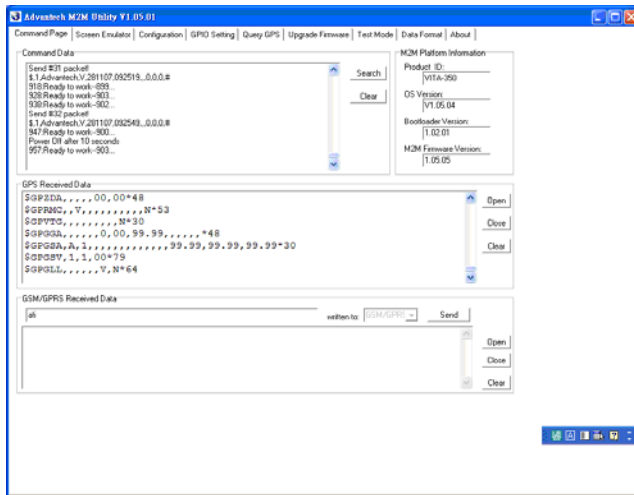


7. Reboot the VITA-350E, then the data will be sent to your specified server.

The build-in functions shipped with VITA-350E can help you to control some basic data formats. You can also change your own data format which will be described in Chapter 3 - *Formats for Sending Packets*.

The following sections provide an overview to the basic functions for customizing VITA-350E-based solution.

3.2.1 Command Page Tab



There are 4 groups on the Command Page Tab: *Command Data*, *GPS Received Data*, *GSM/GPRS Received Data*, and *M2M Platform Information*.

3.2.1.1 Command Data group

The **Search** button in the *Command Data* group : Searches for VITA-350E devices on the serial port cable.

The **Clear** button in the *Command Data* group : Clears the command list data.

Command Data list : Shows the VITA-350E status list.

3.2.1.2 GPS Received Data group

The **Open** button in *GPS Received Data* group : Opens the GPS port.

The **Close** button in *GPS Received Data* group : Closes the GPS port.

The **Clear** button in *GPS Received Data* group : Clears the GPS Received data list.

The *GPS Received Data* list : Shows the VITA-350E GPS data.

3.2.1.3 GSM/GPRS Received Data group

The **Open** button in *GSM/GPRS Received Data* group : Opens the GSM port while GSM mode is set to AT-Command mode.

The **Close** button in *GSM/GPRS Received Data* group : Closes GSM port while GSM mode is set to AT-Command mode.

The **Clear** button in *GSM/GPRS Received Data group* : Clears the GSM/GPRS Received data list.

GSM/GPRS Received Data list : Shows the VITA-350E GSM data.

3.2.1.4 M2M Platform Information

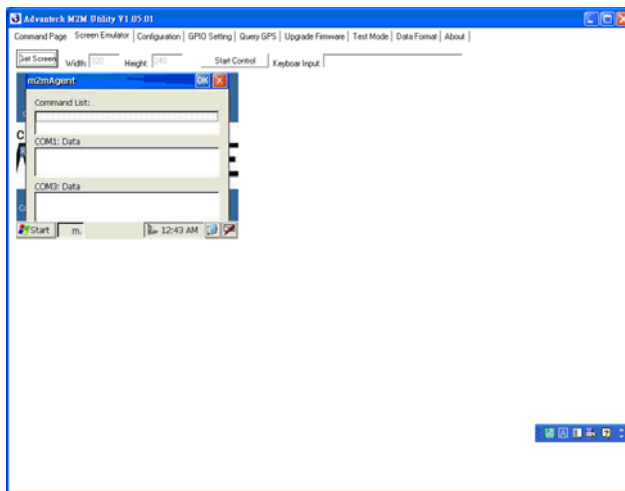
Product ID static text in *M2M platform information group* : Shows platform name - should be VITA-350E.

OS version static text in *M2M platform information group* : OS version recieved from VITA-350E.

Bootload Version static text in *M2M platform information group* : Boot-loader version and from VITA-350E.

M2M Firmware Version static text in *M2M platform information group* : M2M engine version from VITA-350E.

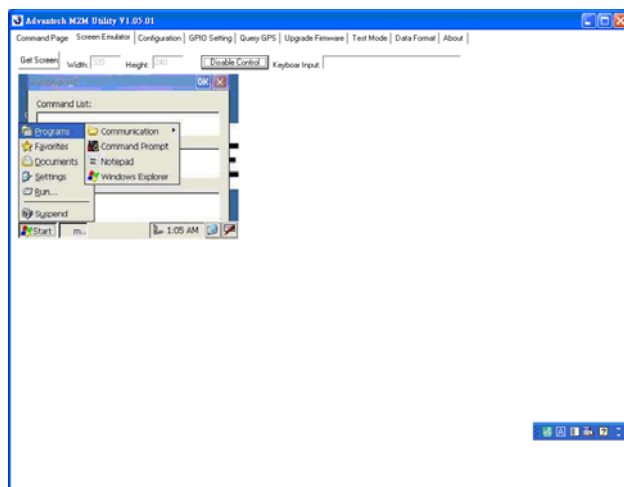
3.2.2 Screen Emulator Tab



You can change the screen emulator quality on the *Screen Emulator* page. The default quality value is 5 %.

The **Get Screen** button : Gets the current screen for VITA-350E. The default size of screen width is 320, and the default screen height is 240.

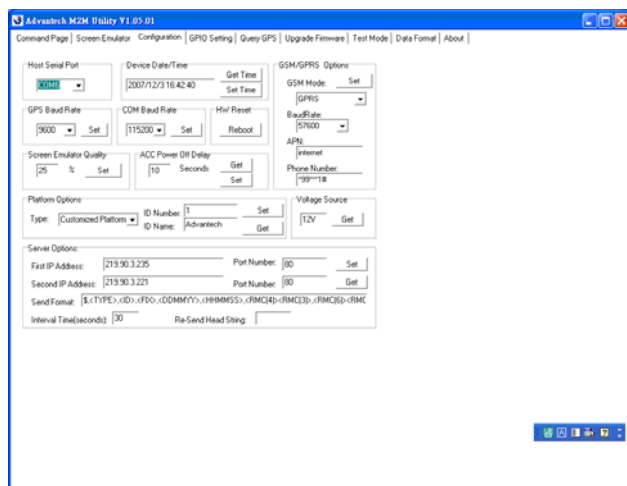
The **Start Control** button : Begins control of VITA-350E by mouse and keyboard. After pressing the button, the name of the button will change to **Disable Control**.



The **Disable Control** button : Stops controlling VITA-350E by mouse and keyboard.

Keyboard input field: Inputs characters that will be sent to VITA-350E.

3.2.3 Configuration Tab



This page is the main settings page for VITA-350E. These values will be received first when the VITA-350E is searched. There are several groups in this page. These groups include: *Host Serial Port*, *Device Date/Time*, *GSM/GPRS Options*, *GPRS Baud Rate*, *COM Baud Rate*, *H/W Reset*, *Screen Emulator Quality*, *ACC Power Off Delay*, *Platform Options*, *Voltage Source*, and *Server Options*.

3.2.3.1 Host Serial Port group

The *Host Serial Port* combo-box : Assigns the PC connected COM port ID. All available serial ports will be a item in this list. You should select an available serial port and connect VITA-350E to this port.

3.2.3.2 Device Date/Time group

The **Get Time** button in the *Device Date/Time* group : Gets the current time from VITA-350E.

The **Set Time** button in the *Device Date/Time* group : Sets the PC current time to VITA-350E.

3.2.3.3 GSM/GPRS Options group

The *GSM Mode* combo-box in *GSM/GPRS Options* group : Selects the AT-command or GPRS mode for GSM module. If the mode is set to GPRS, the M2M engine will automatically connect the AP station with the specified APN, phone number. If the mode is set to AT-command, the M2M engine will open the GSM module port with the specified baud rate.

The *Baud Rate* combo-box in *GSM/GPRS Options* group : Selects a baud rate for the GSM module. It is only used on AT-command mode.

APN edit in *GSM/GPRS Options* group : Specifies the APN name when GPRS mode is selected. The default value is *Internet*.

Phone Number edit in *GSM/GPRS Options* group : Specifies the phone number when GPRS mode is selected. The default is *99***1#.

The **Set** button in *GSM/GPRS Options* group : Sets GSM/GPRS options for VITA-350E.

3.2.3.4 GPS Baud Rate group

The *GPS Baud Rate* combo-box in *GPS Baud Rate* group : Defines the baud rate of the GPS module. This is fixed and should not be changed by users.

The *COM Baud Rate* combo-box in *COM Baud Rate* group : Defines the baud rate of VITA-350E COM module. This COM via VITA-350E is connected and defined by the user.

The **Reboot** button in *H/W Reset* group : Reboots the VITA-350E device.

3.2.3.5 Screen Emulator Quality group

Screen Emulator Quality edit in *Screen Emulator Quality* group : Defines the screen quality percent when getting screen option enabled. The range of the value is from 1 % to 100 %.

The **Set** button in *Screen Emulator Quality* group : Sets the specified screen quality to VITA-350E.

3.2.3.6 ACC Power OFF Delay group

The *ACC Power Off Delay* edit in *ACC Power OFF Delay* group : Defines the delay seconds when the ACC power turned off.

The **Get** button in *ACC Power OFF Delay* group : Gets the ACC power off delay in seconds from VITA-350E.

The **Set** button in *ACC Power OFF Delay* group : Sets the ACC power off delay in seconds to VITA-350E.

3.2.3.7 Platform Options group

The *Type* combo-box in *Platform Options* group : Sets the “type” of VITA-350E. The current available items are *Standard Platform* and *Customized platform*. The Standard Platform is specified by Advantech and the data format is binary. The Customized Platform is specified by the user and the data format is text. The data format can be changed by users. The default type is Customized Platform.

ID number edit in *Platform Options* group : Defines the ID number of VITA-350E. This text will be sent to server when the format included the string <ID>.

ID name edit in *Platform Options* group : Defines the ID name of VITA-350E. This text will be sent to server when the format included the string <TYPE>.

The **Set** button in *Platform Options* group : Sets the ID number and Name to VITA-350E.

The **Get** button in *Platform Options* group : Gets the ID number and Name from VITA-350E.

3.2.3.8 Voltage Source group

Voltage Source static text in *Voltage Source* group : Shows the Voltage Source. The value should be 12V or 24V.

The **Get** button in *Voltage Source* group : Gets the Voltage Source from VITA-350E.

3.2.3.9 *Server Options* group

The *First IP Address* edit text in *Server Options* group : Defines the first server IP address. The VITA-350E will send data to the first server periodically.

The *First IP Port Number* edit text in *Server Options* group : Defines the first server socket port number.

The *Second IP Address* edit text in *Server Options* group : Defines the second server IP address. VITA-350E will send data to the second server when the first server is unconnected.

The *Second IP Port Number* edit text in *Server Options* group : Defines the second server socket port number.

The *Send Format* edit text in *Server Options* group : Defines the format of data sent to the server. The format descriptions are documented in Chapter 3. The default format is \$,<TYPE>,<ID>,<FIX>,<DDM-MYY>,<HHMMSS>,<RMC(4)><RMC(3)>,<RMC(6)><RMC(5)>,<SP EED>,<ANGLE>,0,#<CR><LF>

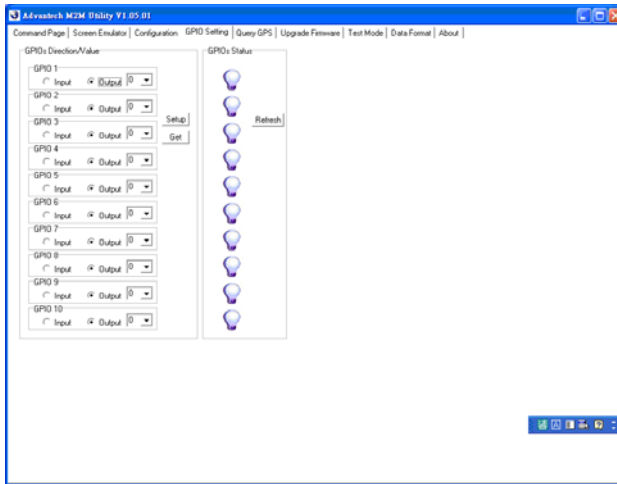
The *Interval Time* edit text in *Server Options* group : Defines the interval seconds between data packets. The default value is 30 seconds.

The *Re-Send Head String* edit text in *Server Options* group : Defines the re-sent data head string. When the server is disconnected or GPRS has failed, the sent data will be saved in VITA-350E's internal memory. If the server is connected, then the unsent data will be sent again. The Re-Send Head string is designed to replace the normal send-head string when the re-send process occurs. For example, if the Re-Send Head string is \$@, then the re-sent data head will be changed from \$, to \$@.

The **Set** button in *Server Options* group : Sets server options to VITA-350E.

The **Get** button in *Server Options* group : Gets server options from VITA-350E.

3.2.4 GPIO Setting Tab



The *GPIO Setting* Page enables you to define and get the GPIO directions and values from/to VITA-350E remotely. There are 10 GPIO pins in VITA-350E. Every GPIO pin could be set to input or output.

The *GPIO Direction #n* radio button in *GPIOs Direction/Value* group : Specifies the direction of GPIO #n where n is from 1 to 10.

The *GPIO Value #n* combo-box in *GPIOs Direction/Value* group : Specifies the output value of GPIO pin #n when the direction of the pin defined to output.

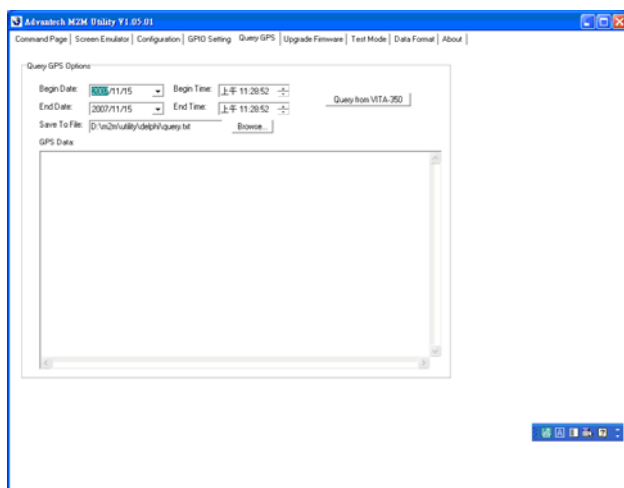
The *GPIO Status #n* picture in *GPIOs Status* group : Shows the current status of GPIO pin #n.

The **Setup** button in *GPIOs Direction/Value* group : Sets up directions and values of the GPIO pins to VITA-350E.

The **Get** button in *GPIOs Direction/Value* group : Gets directions and values of GPIO pins from VITA-350E.

The **Refresh** button in the *GPIOs Status* group : Gets the values of GPIO pins from VITA-350E.

3.2.5 Query GPS Tab



The *Query* Page enables that you query GPS data from VITA-350E within the specified time range.

The *Begin Date* date selector : Selects the begin date for GPS data in VITA-350E.

The *Begin Time* time selector : Selects the begin time of GPS data in VITA-350E.

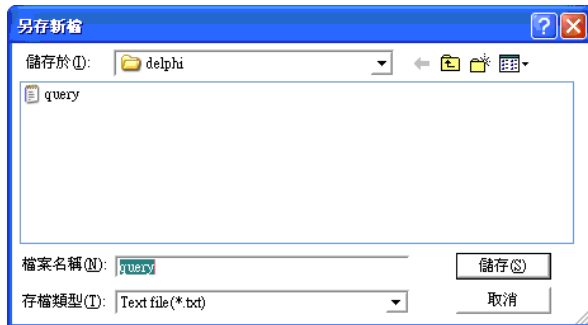
The *End Date* date selector : Selects the begin date of GPS data in VITA-350E.

The *End Time* time selector : Selects the begin time of GPS data in VITA-350E.

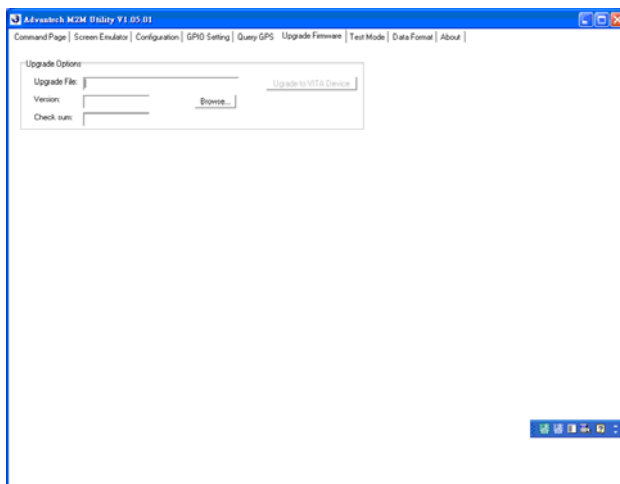
The *Save to File* edit text : Specifies the filename to save the query GPS data.

The **Query from VITA-350E** button : Starts querying the GPS data within specified dates and times.

The **Browse** button : Browses the folder and selects the path and file to save queried GPS data.



3.2.6 Upgrade Firmware Tab



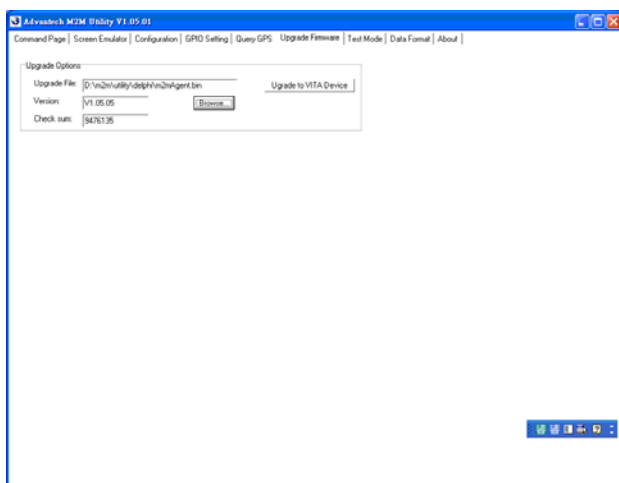
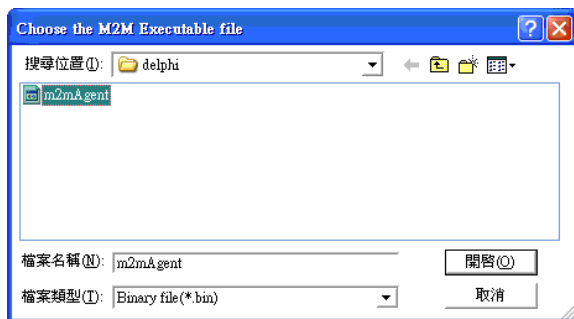
This *Upgrade Firmware* tab page enables you to upgrade the M2M firmware engine to VITA-350E.

The *Upgrade File* edit text : Specifies the firmware file. It should include the file path and filename.

The *Version* static text : Shows the version for upgrading the firmware.

The *Check sum* static text : Show the checksum for upgrading firmware.

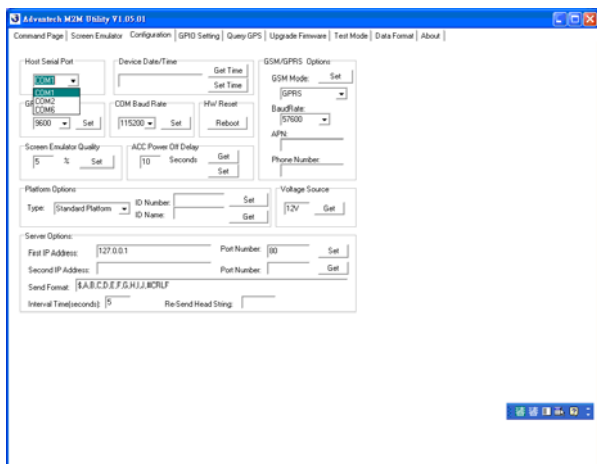
The **Browse** button : Browses the folder and selects a path and file to upgrade to VITA-350E. This upgrade firmware file should be named: m2magent.bin. There is a file named m2magent.ver in the same folder.



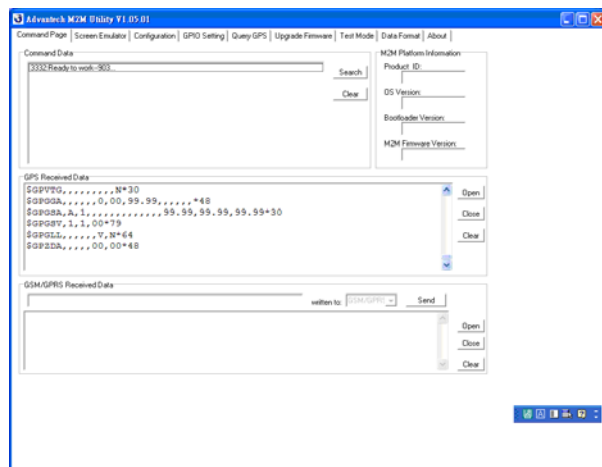
Upgrade to VITA Device button : Starts upgrading the specified firmware to VITA-350E.

The upgrade procedure is as follows:

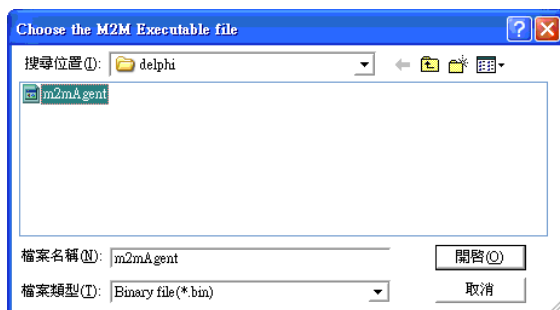
1. Power-on VITA-350E device.
2. Connect your PC to VITA-350E with COM port by Modem cable.
3. Choose your PC COM port on the *Configuration* tab page in the M2M utility.



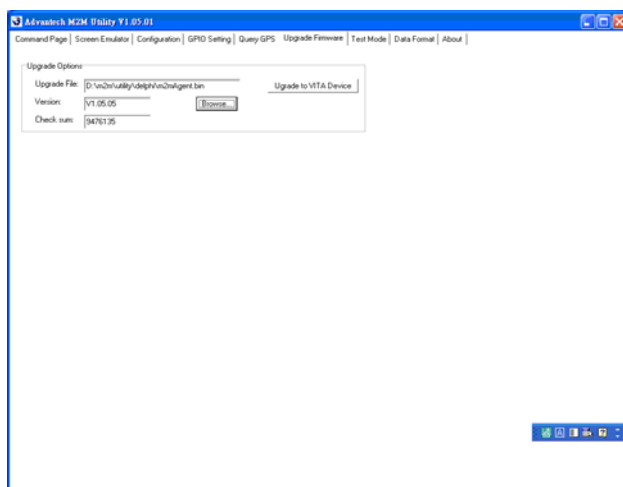
4. Press the **Search** Button on the *Command* page



VITA-350E information will be read to your PC.

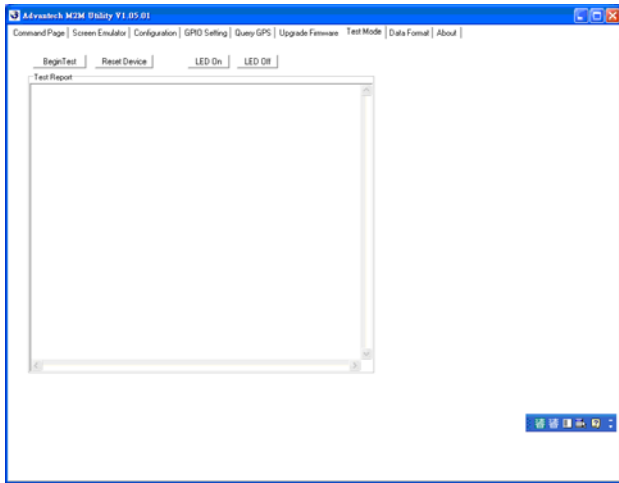


6. The firmware upgrade information will be shown on the screen, just click the **Upgrade** button to update the VITA Device.



7. Change the tab-page to *Command Page*, you will see the string `DOC_CMD_WRITEFILE` Cmd begin.

3.2.7 Test Mode Tab



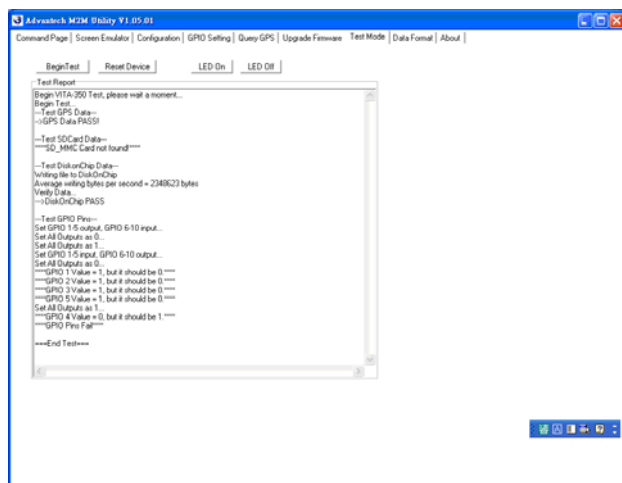
The *Test Mode* page enables you to test that the I/O functions of VITA-350E devices work or not.

The **Begin Test** button : Starts the I/O function tests for VITA-350E. The I/O tests include: *GPS test*, *SD Card test*, *flash ROM test*, and *GPIO test*.

The **Reset Device** button : Resets VITA-350E and sets default parameters.

LED On button : Turns on the error LED of VITA-350E.

LED Off button : Turns off the error LED of VITA-350E.



3.2.8 Data Format Tab

Advantech M2M Utility V1.05.01

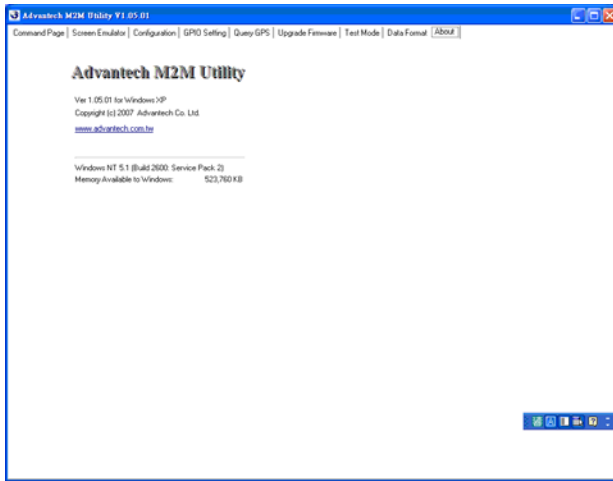
Command Page | Screen Emulator | Configuration | GPIO Setting | Query GPS | Upgrade Firmware | Test Mode | Data Format | About |

GPS Data Fields Definition:

	#GPBMC	#GPVTG	#GPGGA	#GPGSA	#GPRSV	#GPGLL	#GPZDA
1	Message ID	Offset Dir	Mmmss.ss	Mode	#Message	Latitude	Mmmss.ss
2	Status	Offset	Latitude	Mode	Message ID	N or S	DD
3	Latitude	M Offset Dir	N or S	ID1	#satellites	Longitude	MM
4	N/S Indicator/M Offset	Longitude	ID1			E or W	YYYY
5	Longitude	Speed	E or W	ID3		Mmmss.ss	Number
6	E/W Indicator/knots	GPS Quality	ID4			Valid	
7	Speed	Speed	number of sat	ID5			
8	Course	KM	HDOP	ID6			
9	Date		Height	ID7			
10	MSL Altitude		Actual Height	ID8			
11	Magnetic Var		Time	ID9			
12			ID	ID10			
13				ID11			
14				ID12			
15				PDOP			
16				HDOP			
17				VDOP			

* This page displays the fields of GPS data.

3.2.9 About Tab



3.3 Format for Sending Packets

The format for Sending Packets section explains the string formats for different data fields. In this chapter, you will learn the formats for M2M data fields.

This chapter shows you how to format data sent by VITA-350E. Firstly, you must design the fields of data received by your server. Your server should have the capacity to process data which is sent normally or re-sent abnormally from VITA-350E. Secondly, you can transfer data fields from raw data to format identifiers of VITA-350E. The format identifiers supported by VITA-350E are listed as follows:

Identifier	Data String	Description	Example
<ID>	ssss	Platform ID Number	001
<TYPE>	ssss	Platform Type Name	Advantech
<PACKET>	9999	Packet number from system starting.	20
<FIX>	a	Status (A=valid, V=invalid, R=unavailable)	A
<GPIO>	XXX	GPIO Status	3F2
<LASTFIX-DATE>	DDM MY	UTC Date for last valid RMC data.	281107
<LASTFIX-TIME>	HHM MSS	UTC Time for last valid RMC data.	205950
<LASTFIX-LONX>	SDD DM M.m mm m	Longitude for last valid RMC data. S is (-) for West	12145.1214 -12001.2589
<LASTFIX-LATY>	SDD MM. mm mm	Latitude for last valid RMC data. S is (-) for South	1245.1214 -1201.2589
<SPEED>	999	Speed, UoM are km/hr	90
<ANGLE>	999	Angle, UoM are degrees	25
<CR>	0x0D	Carriage Character	0x0D
<LF>	0x0A	Linefeed Character	0x0A
<STATUS>	x	The status of VITA-350E. 2:Normal 5:ACC Power off	5
<DDMMYY>	DDM MY	UTC Date Value are from RMC valid or RTC of VITA-350E.	281107
<YYMMDD>	YYM MDD	UTC Date Value are from RMC valid or RTC of VITA-350E.	071128

<YYYYM-MDD>	YYY YMM DD	UTC Date Values are from RMC valid or RTC of VITA-350E.	20071128
<HHMMSS>	HHM MSS	UTC Time. Values are from RMC valid or RTC of VITA-350E.	205950
<RMC(1)>	HHM MSS .sss	UTC Time	205950.000
<RMC(2)>	a	Status (A=valid, V=invalid)	A
<RMC(3)>	DDM M.m mm m	Latitude	1825.4523
<RMC(4)>	d	Direction (N:north,S:south)	N
<RMC(5)>	DDD MM. mm mm	Longitude	12145.1214
<RMC(6)>	d	Direction (E:east,W:west)	E
<RMC(7)>	z.z	Speed over ground (knots).	63.52
<RMC(8)>	y.y	Course over ground (reference to true north).	240.31
<RMC(9)>	DDM MY Y	UTC date	281107
<RMC(10)>	d.d	(Null) or Magnetic variation (degrees)	
<RMC(11)>	v	(Null) or Variation sense (E=east, W=west)	
<GGA(1)>	HHM MSS .sss	UTC Time	205950.000
<GGA(2)>	DDM M.m mm m	Latitude	1825.4523
<GGA(3)>	d	Direction (N:north,S:south)	N

<GGA(4)>	DDD MM. mm mm	Longitude	12145.1214
<GGA(5)>	d	Direction (E: east, W: west)	E
<GGA(6)>	q	GPS quality indicator (0 - Fix not available, or invalid 1 - GPS SPS Mode, fix valid 2 - Differential, GPS SPS Mode, fix valid 3 - GPS PPS Mode, fix valid)	1
<GGA(7)>	ss	Number of satellites in use (in tracking), ss=0..12	05
<GGA(8)>	h.h	Horizontal dilution of precision h.h : HDOP	2.0
<GGA(9)>	a.a	Antenna altitude re: mean- sea-level (geoid)	59.0
<GGA(10)>	M	UoM for antenna altitude in meters	M
<GGA(11)>	(Null)	Geoidal separation (Not supported)	
<GGA(12)>	(Null)	UoM for geoidal separation (Not yet supported)	
<GGA(13)>	x.x	Age of differential GPS data(NULL)	
<GGA(14)>	xxxx	Differential reference station ID	
<GSA(1)>	a	Mode: A- Automatic M - Manual (forced to operate in 2D or 3 D mode)	A
<GSA(2)>	x	Mode: 1 = Fix not available 2 = 2D 3 = 3D	1

<GSA(3)>	s	1 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(4)>	s	2 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(5)>	s	3 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(6)>	s	4 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(7)>	s	5 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(8)>	s	6 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(9)>	s	7 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(10)>	s	8 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(11)>	s	9 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(12)>	s	10 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(13)>	s	11 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(14)>	s	12 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(15)>	p.p	PDOP	
<GSA(16)>	h.h	HDOP	
<GSA(17)>	v.v	VDOP	

<GLL(1)>	DDM M.m mm m	Latitude	1825.4523
<GLL(2)>	d	Direction (N:north,S:south)	N
<GLL(3)>	DDD MM. mm mm	Longitude	12145.1214
<GLL(4)>	d	Direction (E:east,W:west)	E
<GLL(5)>	HHM MSS .sss	UTC Time	205950.000
<GLL(6)>	a	Status (A=valid, V=invalid)	A
<VTG(1)>	t.t	Course Over Ground (degrees True) 0 if over current DOP mask	
<VTG(2)>	T	Units: T - degrees True	
<VTG(3)>	m.m	Course Over Ground (degrees Magnetic) 0 if over current DOP mask	
<VTG(4)>	s.s	Speed (knots). 0 if over current DOP mask	
<VTG(5)>	N	Units: N @C knots	
<VTG(6)>	g.g	Speed (Km/hr). 0 if over current DOP mask	
<VTG(7)>	K	Units: K - Km/hr	

Note: UoM=Unit of Measurement

Examples:

\$,<TYPE>,<ID>,<FIX>,<DDM-
MY>,<HHMMSS>,<RMC(4)><RMC(3)>,<RMC(6)><RMC(5)>,<SP
EED>,<ANGLE>,0,<CR><LF>

GPIO Definition

The VITA-350E is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A GPIO Definition

A.1 GPIO Definition

Table A.1: GPIO Definition

GPIO No.	Function
GPIO_1	IN
GPIO_2	IN
GPIO_3	IN
GPIO_4	IN
GPIO_5	IN
GPIO_6	OUT
GPIO_7	OUT
GPIO_8	OUT
GPIO_9	OUT
GPIO_10	OUT

5 IN/ 5 OUT is default GPIO setting, and it could be customized,
Ex, 4 IN / 6 OUT.

A.2 GPIO DC Spec.

VCCQ: 3.3V (Typical)

VSS: GND

Table A.2: Output DC Operating Conditions

VOH	Output High Voltage, all standard output and I/O pins	VCCQ-0.1		VCCQ	V
VOL	Output Low Voltage, all standard output and I/O pins	VSS		VSS+0.4	V
IOH_H	Output High Current, all standard, high-strength output and I/O pins (VO=VOH)	-10			mA
IOH_L	Output High Current, all standard, low-strength output and I/O pins (VO=VOH)	-3			mA
IOL_H	Output Low Current, all standard, high-strength output and I/O pins (VO=VOH)	10			mA
IOL_L	Output Low Current, all standard, low-strength output and I/O pins (VO=VOH)	3			mA

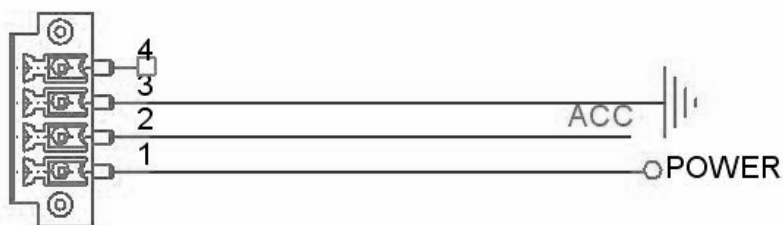
Accessories

Appendix B Accessories

The VITA-350E requires several cables for normal operation. You can make them yourself or purchase an optional cable kit assembly, which includes the following.

B.1 Power Cable

CN15



PLUG_4_3.50 mm



PIN1: Power Input, Red line, 12 V / 24 V Car Battery DC constant Input.

PIN2: ACC, Yellow line, Ignition/Switching power, see the related operating power at notes3.

PIN3: GND, Black line, ground,

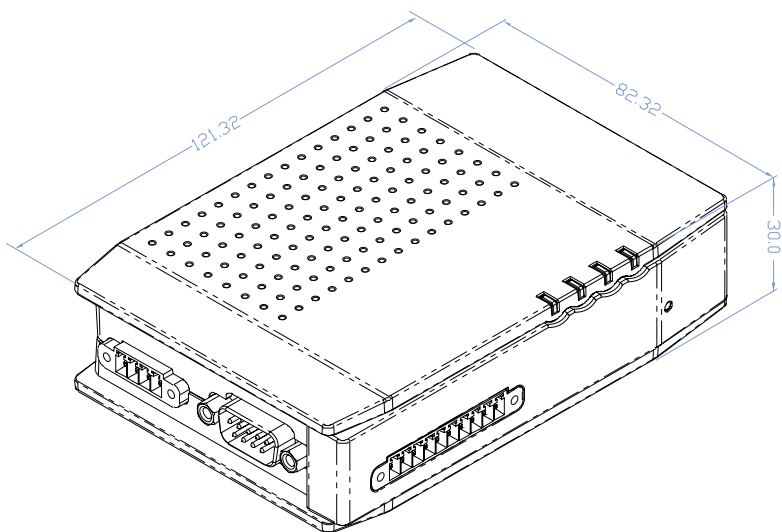
Notes:

1. The length of Power cable is 3 M.
2. Power Input Voltage 9~35 V.
3. Power Operating Voltage 10~30 V (9 V would be looked as battery low).

Mechanical Drawings

Appendix C Mechanical Drawing

C.1 Mechanical Drawing



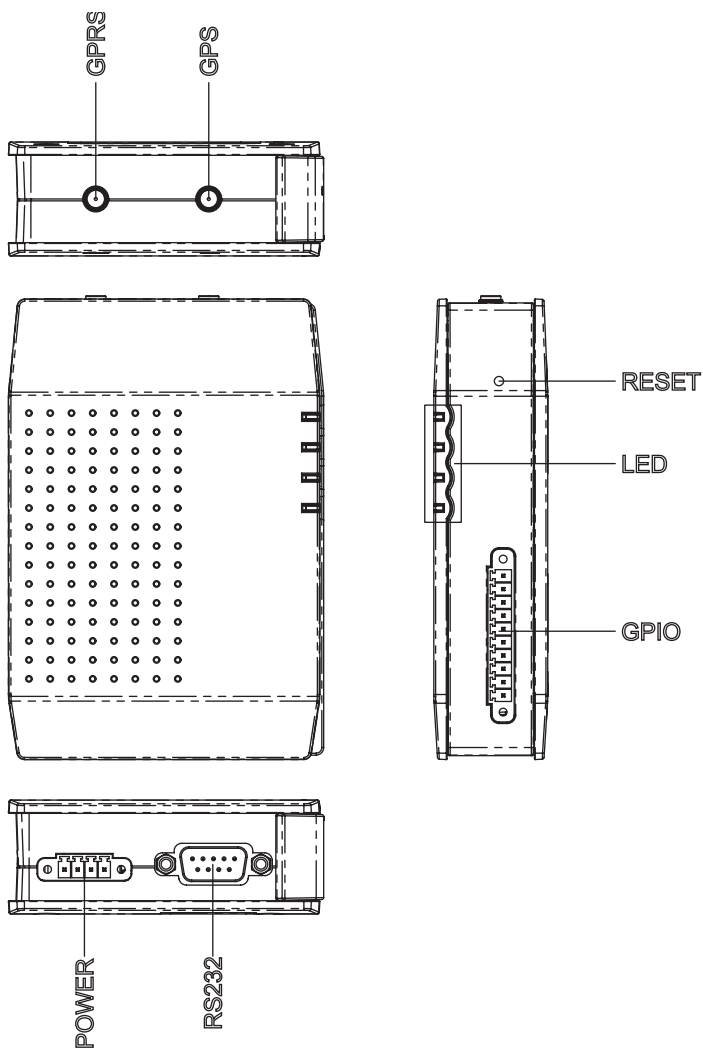


Figure C.1: VITA-350E Mechanical Drawing

